

CLAIMS

1. An orthopaedic cement mixing apparatus comprising a mixing chamber and a cylindrical dispensing chamber, the mixing chamber having an outlet opening and the dispensing chamber having an inlet opening, the outlet opening and the inlet opening being arranged so as to allow cement mixed in the mixing chamber to pass into the dispensing chamber; closure means having a first position separating the outlet opening of the mixing chamber and the inlet opening of the dispensing chamber; and means for applying a vacuum to the mixing chamber and to the dispensing chamber; characterised in that the apparatus further comprises switching means for switching the applied vacuum between the mixing chamber and the dispensing chamber.
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2. The apparatus as claimed in claim 1, wherein the closure means is a piston which, in its first position, is located at the top of the dispensing chamber.
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3. The apparatus as claimed in claim 1 or 2, wherein the dispensing chamber is a cylindrical body of a dispensing syringe.
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4. An orthopaedic cement mixing apparatus comprising a mixing chamber and a dispensing chamber, the mixing chamber having an outlet aperture and the dispensing chamber having an inlet aperture, the outlet aperture and the inlet aperture being in cement flow communication, the apparatus further comprising a mixing paddle extending into said mixing chamber and a rotatable handle coupled to said paddle by a gear mechanism arranged such that rotation of said handle causes said paddle to rotate about its own axis and also moves the axis of rotation of the paddle within the chamber whereby the paddle is moved around substantially
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the entire cement containing region of the interior of the chamber.

- 5 5. The apparatus of claim 4, wherein the mixing chamber is a bowl.
- 10 6. The apparatus of claim 4 or 5, further comprising switching means for switching the applied vacuum between the mixing chamber and the dispensing chamber.
- 15 7. An orthopaedic cement mixing apparatus comprising a mixing chamber, a mixing paddle extending into said chamber and a rotatable handle coupled to said paddle by a gear mechanism arranged such that rotation of said handle causes said paddle to rotate about its own axis and also move the axis of rotation of the paddle within the chamber whereby the paddle is moved around substantially the entire cement containing region of the interior of the chamber; characterised by a scraper element connected to said gear mechanism so as to rotate with the axis of rotation of the paddle in the same or 20 in the opposite direction.
- 25 8. The apparatus of claim 7, wherein the scraper is shaped such that it extends radially from the gear mechanism to the inside wall of the mixing chamber and extends axially to conform to the shape of the inside wall of the mixing chamber.
- 30 9. An orthopaedic cement mixing apparatus comprising a mixing chamber and a dispensing chamber, the mixing chamber having an outlet aperture and the dispensing chamber having an inlet aperture, the inlet aperture and the outlet aperture being in cement flow communication, and further comprising closure means which, in a first 35 position, separates the outlet aperture from the inlet aperture preventing flow of cement from the mixing

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chamber to the dispensing chamber; characterized in that the closure means is held in its first position by a releasable fastening means.

- 5 10. The apparatus as claimed in claim 9, wherein the releasable fastening means comprises a removable pin which passes through the wall of the dispensing chamber and into the closure.
- 10 11. The apparatus as claimed in claim 9, wherein the releasable fastening means comprises an O-ring which is dimensioned such that it provides a friction grip between the closure wall and the inner wall of the dispensing chamber.
- 15 12. The apparatus as claimed in claim 11, wherein the mixing chamber and the dispensing chamber are simultaneously, during the whole mixing and dumping process, under a vacuum.
- 20 13. The apparatus as claimed in claim 11 or 12, wherein the closure means is provided with a light seal or an O-ring sufficient to hold the closure means in place between the mixing chamber and the dispensing chamber.
- 25 14. An orthopaedic cement mixing apparatus comprising a mixing chamber and a dispensing chamber, the mixing chamber having an outlet aperture and the dispensing chamber having an inlet aperture, the inlet aperture and the outlet aperture being in cement flow communication, and further comprising closure means for separating the inlet aperture and the outlet aperture to prevent the flow of cement from the mixing chamber to the dispensing chamber, wherein the closure means is moveable between a closed position whereby flow of cement from the mixing chamber to the dispensing chamber is prevented and an open position whereby cement can flow from the mixing
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AMENDED CLAIMS

[received by the International Bureau on 08 July 2004 (08.07.04);
original claim 14 amended; new claims 15-20 added;
remaining claims unchanged (2 pages)]

chamber to the dispensing chamber.

15. The apparatus of claim 14, wherein the closure comprises a 'trap door' arrangement, whereby cement is mixed in the mixing chamber which is closed, at the bottom, by a slidable closure which can then be opened or removed when the cement is mixed and the cement then drops down into the syringe.
- 10 16. The apparatus of claim 15, wherein said trap door arrangement comprises a pull-out trap door, wherein the closure comprises a plate slidably located between the mixing chamber and the dispensing chamber, the plate having a closed portion which, in its closed position, prevents the flow of cement from the mixing chamber to the dispensing chamber, and an aperture portion, which aligns with the outlet aperture and the inlet aperture to allow cement flow therethrough, the plate being slidably located such that the user can pull the plate 15 to a first position whereby the closed portion is located between the inlet aperture and the outlet aperture, and a second position wherein the aperture is 20 located between the inlet aperture and the outlet aperture.
- 25 17. The apparatus of claim 16, wherein the plate is provided with a handle or pull ring.
- 30 18. The apparatus of claim 14, wherein the closure comprises a tap defining a channel or passage therethrough, which fits between the mixing chamber and the dispensing chamber.
- 35 19. The apparatus of claim 14, wherein the closure comprises a ball with a hole therethrough, located between the mixing chamber and the dispensing chamber.

20. The apparatus of claim 14, wherein a vacuum is applied to the mixing chamber and to the dispensing chamber both during mixing and dumping.